



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/684,568      | 10/06/2000  | Yukio Tanaka         | SEL 219             | 2087             |

7590 10/01/2004  
COOK, ALEX, McFARRON, MANZO  
CUMMINGS & MEHLER, LTD.  
SUITE 2850  
200 WEST ADAMS STREET  
CHICAGO, IL 60606

EXAMINER

JORGENSEN, LELAND R

ART UNIT PAPER NUMBER

2675

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |  |                                      |  |
|------------------------------|--|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/684,568   | <b>Applicant(s)</b><br>TANAKA, YUKIO |  |
|                              | <b>Examiner</b><br>Leland R. Jorgensen | <b>Art Unit</b><br>2675              |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2004.  
2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 - 49 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 - 49 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. In light of applicant's argument, the rejection of claims 1- 49 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is withdrawn. The critical issue is whether specification and claims as originally filed teach that the "first TFT has a first LDD region not overlapped by a gate electrode of said first TFT" as taught in amended independent claims 1, 2, 15, 18, 21, 36, and 43. These claim teach that the first TFT is the pixel TFT. In response to examiner's statement that the specification does not teach that the first TFT has a first LDD region not overlapped by a gate electrode of the said first TFT, applicant cites page 17, line 18 – page 18, line 2 of the originally filed specification [page 19, lines 4 – 12 of the substitute specification] which reads:

Then, the step of adding an impurity imparting n-type for formation of the LDD regions of the N-channel TFT in the pixel section was carried out. Here, by using the gate electrode 6031 as a mask, the impurity element for imparting n-type was added in a self-alignment manner. The concentration of phosphorus (P) added was  $1 \times 10^{16}$  to  $5 \times 10^{18}$  atoms/cm<sup>3</sup>; by thus adding phosphorus at a concentration lower than the concentrations of the impurity elements added in the steps shown in Figs. 9A, 10A and IOB, only impurity regions 6043 and 6044 are substantially formed. In this specification, the concentration of the impurity element imparting the n-type contained in the impurity regions 6043 and 6044 is represented by (n-). (Fig. 10C)

If the gate electrode 6031 is used as a mask while the impurity elements are added for the formation of LDD regions in the pixel TFT, then it follows that the pixel TFT has a LDD region not overlapped by the gate electrode of the first TFT. Moreover, a review of the art suggests that it is the normal practice in the art to not overlap the LDD and the pixel TFT.

***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1, 2, 7, 12 – 23, 36, 41 – 43, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al., USPN 6,339,411 B2, in view of Kobayashi et al., USPN 5,767,930.

**Claims 1, 2, 15, 18, 21, 36, and 43**

Miyazaki teaches a display device. Miyazaki, col. 1, lines 4 – 8.

Miyazaki teaches a pixel portion with  $m \times n$  pixels. Miyazaki, col. 2, line 60 – col. 3, line 14. A gate driver [line scan shift register 22a] feeds  $n$  gate signal lines. Miyazaki, col. 8, lines 16 - 30; and figure 7B. Source drivers [dot scan shift registers 22b, 22c, 22d] feed  $m$  source signal lines. Miyazaki, col. 8, lines 6 - 15; and figure 7B. Miyazaki, in figures 5A – 5C, shows that  $m < n$ .

Miyazaki teaches a video data converter circuit wherein the video data converter circuit converts a digital video datum  $(h, k)$  ( $h = 1, 2, 3, m-1, m$ ) and ( $k = 1, 2, 3, \dots, n-1, n$ ). Miyazaki, col. 5, lines 21 – 40; col. 6, line 36 – col. 7, line 3; and figure 3. Although Miyazaki does not specifically state that the video datum  $(h, k)$  is converted into  $\{m \times (k - 1) + h\}$ -th video datum, such conversion takes place. Compare the conversion shown in the specification, figures 3, 5, 6, and 7 with the conversion shown in Miyazaki, figure 5C and described in Miyazaki col. 6, line 36 – col. 7, line 3. Thus, it would have been obvious to one of ordinary skill in the art at the time

Art Unit: 2675

of the invention to find the equation taught by Miyazaki. Miyazaki invites such by teaching a head-mounted display,

Here, in the head-mounted display described above, considering the need to make the display part positioned in front of the eyes of the user small and light and considering aesthetic design aspects, it is desirable for the head-mounted display to be made small in the front-rear direction.

Miyazaki, col. 2, lines 21 – 25. Miyazaki adds,

Thus because of the difficulty of reducing the size of the liquid crystal panel 80 in the vertical direction there has been the problem that it is not possible to realize size reduction of a head-mounted display in the front-rear direction.

It is therefore an object of the present invention to provide a display device with which it is possible to effectively realize size reduction in the vertical direction.

Miyazaki, col. 2, lines 53 – 59. Miyazaki then adds,

With the first provision of the invention described above, because a data stream obtained by vertical-horizontal converting ordinary image data by means of vertical-horizontal converting means is supplied to the displaying means and the display operation is executed by vertical pixel rows being scanned in the horizontal direction, it becomes natural for the line scan driving circuit to be disposed above or below the display region in the displaying means. In other words, it becomes unnecessary for a pixel driving circuit requiring a large area for circuit provision to be disposed above or below the display region, and as a result there is the effect that it becomes possible to effectively reduce the size of the displaying means in the vertical direction. And when the display device is to be mounted in a head-mounted display, this makes it possible to reduce the size of the head-mounted display in the front-rear direction.

Miyazaki, col. 3, lines 49 – 64. Miyazaki concludes,

When according to the other provision of the invention mentioned above two units of the displaying means are disposed left-right symmetrically and the display controlling means supplies image data and scanning signals to these two displaying means so that they display the same image while mutually inverted in a top-bottom direction and in a left-right direction, there is the effect that it is possible to raise the freedom of configuration design of for example a head-mounted display or the like.

Art Unit: 2675

Miyazaki, col. 4, lines 28 – 36.

Miyazaki does not teach a pixel TFT nor drive TFTs.

Kobayashi teaches a first TFT [pixel switching TFT 10] that has first LDD region [18] not overlapped by a gate electrode [14] of said first TFT. Kobayashi, col. 7, lines 20 – 30; col. 8, lines 50 - 54, col. 10, lines 32 – 33; and figures 3(c) & 4(h). Kobayashi teaches a second TFT and a third TFT [TFT 20 and TFT 30] that have a second LDD region overlapped by gate electrodes [24 & 34] of the second TFT and said third TFT respectively. Kobayashi, col. 13, lines 12 – 31; col. 16, line 40 – col. 17, line 3; and figure 9 & 10.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the drive circuit TFT as taught by Kobayashi with the display device as taught by Miyazaki to form a liquid crystal display and drive on the same substrate, with the performance of the pixel TFT having increased reliability with the drive TFT having greater resistance to increased voltage. Kobayashi, col. 13, lines 23 – 31; and col. 16, lines 40 - 53.

Claims 15 and 36 each add that the video data converter circuit has a video formatter, a memory and an address generator. Miyazaki teaches video formatter [memory controller 9], a memory 3b, and an address generator [driving circuit part 10]. Miyazaki, col. 7, lines 31 – 35; and figure 3.

Claim 18 adds that the gate driver is formed at a lateral side of the pixel portion, and the source driver is formed at a longitudinal side of the pixel portion. Miyazaki teaches such. Miyazaki, col. 7, lines 44 – col. 8, line 5; and figure 7B.

Claim 21 adds that the plurality of gate signal lines are vertical and the plurality of source signal lines are horizontal. Miyazaki, col. 8, lines 6 – 63; and figure 7B.

Claim 43 adds two source drivers. Miyazaki teaches at least two source drivers [dot scan shift registers 22b, 22c, 22d]. Miyazaki, col. 8, lines 6 - 15; and figure 7B.

**Claims 7, 12, 16, 19, 22, 41, and 48**

Miyazaki teaches that the display device is a head mount display 30. Miyazaki, col. 1, lines 4 - 10; col. 5, lines 9 - 16; and figures 8A - 8C.

**Claim 13, 14, 17, 20, 23, 42, and 49**

Miyazaki teaches that the display device is a liquid crystal display device. Miyazaki, col. 1, lines 5 - 8. Miyazaki, col. 1, lines 3 - 9.

4. Claims 3, 4, 8, 9, 24, 25, 28, 29, 32, 33, 37, 38, 44, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. over Kobayashi as applied to claims 1, 2, 15, 18, 21, 36, and 43 above, and further in view of Yamazaki et al., USPN 6,292,183 B1.

**Claims 3, 8, 24, 28, 32, 37, and 44**

Neither Miyazaki nor Kobayashi teach a rear projector with three display devices.

Yamazaki teaches a rear projector with three liquid crystal display devices. Yamazaki, col. 7, lines 22 - 24; col. 17, line 60 - col. 18, line 3; col. 18, line 61 - col. 19, line 13; and figures 18, 20A and 20B.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the rear projector with three display devices as taught by Yamazaki with the display device of Miyazaki and Kobayashi. Yamazaki invites such combination by teaching,

The present invention has been made to solve the above problem, and therefore an object of the present invention is to provide a drive circuit that prevents the deterioration of a TFT in a CMOS circuit on a high-voltage side, makes a withstand voltage high, and increases a drive margin in the case where

Art Unit: 2675

two voltages of a high voltage and a low voltage are provided for a supply voltage to a peripheral drive circuit and a high voltage is needed to be applied to a gate signal line.

Another object of the present invention is to provide a liquid crystal display device using the above drive circuit.

Yamazaki, col. 4, lines 22 – 32. Yamazaki specifically invites the use of a projector with the three display devices by teaching,

The three-plate type liquid crystal projector according to this embodiment displays images corresponding to three primary colors consisting of red, blue and green on three monochrome-display liquid crystal panels 1807, 1808 and 1809, respectively, and lightens the above liquid crystal panels by lights of the corresponding three primary colors. Then, the obtained images of the respective primary-color components are composed by dichroic prism 1810 and then projected onto the screen 1812. Therefore, the three-plate type liquid crystal projector is excellent in display performance (resolution, screen illuminance, color purity).

Yamazaki, col. 18, lines 4 – 14.

**Claims 4, 9, 25, 29, 33, 38, and 45**

Yamazaki teaches a front projector with three liquid crystal display devices. Yamazaki, col. 7, lines 25 – 28; col. 17, line 60 – col. 18, line 3; col. 19, lines 28 – 46; and figures 18, and 21.

5. Claims 5, 10, 26, 30, 34, 39, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. over Kobayashi as applied to claims 1, 2, 15, 18, 21, 36, and 43 above, and further in view of Negishi et al., USPN 5,860,720.

**Claims 5, 10, 26, 30, 34, 39, and 46**

Neither Miyazaki nor Kobayashi teach a rear projector with one display device.



Art Unit: 2675

Negishi teaches a rear projector with liquid crystal display device. Negishi, col. 1, lines 4 – 17.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the rear projector with one display device as taught by Negishi with the display device of Miyazaki and Kobayashi. Negishi invites such combination by teaching,

A liquid-crystal rear projector is able to reduce its depth and to widen its screen, and such a liquid-crystal rear projector can be easily enlarged in size compared with a television receiver using a cathode-ray tube (CRT).

Negishi, col. 1, lines 18 – 21.

6. Claims 6, 11, 27, 31, 35, 40, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. over Kobayashi as applied to claims 1, 2, 15, 18, 21, 36, and 43 above, and further in view of Braun et al., USPN 5,335,022.

**Claims 6, 11, 27, 31, 35, 40, and 47**

Neither Miyazaki nor Kobayashi teach a front projector with one display device.

Braun teaches a front projector with liquid crystal display device. Braun, col. 1, lines 9 – 11.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the front projector with one display device as taught by Braun with the display device of Miyazaki and Kobayashi. Braun invites such combination by teaching,

Many computer image, entertainment video, and video teleconferencing services require large-screen displays so that users can realize the maximal benefit and effectiveness of these services. A particular concern with large display screens, especially in residential environments, is the volume of living space encroached upon by the video display screen. A solution to this problem would be a true large-screen flat display having negligible depth that can be hung

Art Unit: 2675

inconspicuously on the wall. This solution, although under research for many years, remains decidedly elusive.

Braun, col. 1, lines 14 – 24. Braun adds,

Another approach to large screen video displays, which minimizes the apparent loss of living space, is front projection systems. A front projection system displays an image by directing the projected light from the projector onto a projection screen which diffusely reflects the light back into the viewing area.

Braun, col. 1, lines 33 – 38. Braun then teaches an object of invention.

An object of our invention is to provide a front projection video display system, which yields high contrast without requiring darkened ambient conditions and minimizes the encroachment on the volume of living space unlike conventional rear projection visual display systems.

Braun, col. 2, lines 14 – 19.

### ***Response to Arguments***

7. Applicant's arguments, see Amendment, pp. 13 – 14 filed 3 June 2004, with respect to the rejection(s) of claim(s) 1 - 39 under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. in view of Ha have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al., USPN 6,339,411 B2, in view of Kobayashi.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Ohtani, USPN 6,674,136 teaches a pixel TFT having an LDD that does not overlap the gate electrode and drive TFT having an LDD that does overlap the gate electrode.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leland R. Jorgensen whose telephone number is 703-305-2650. The examiner can normally be reached on Monday through Friday, 7:00 a.m. through 3:30 p.m..

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

lrj

  
DENNIS-DOON CHOW  
PRIMARY EXAMINER